CONTRACTOR EVIDENCE AUDIT TEAM

CEAT MEMO #1

TO: Carrie Younkers

FROM: Brenda Barcus

DATE: December 31, 1984

REGARDING: Reilly Tar Case

On March 28, 1984, the U.S. E.P.A., National Enforcement Investigations Center (NEIC) requested that the Contract Evidence Audit Team (CEAT) prepare a computer summary of analytical results for the Reilly Tar Case. The computer tape of this summary is enclosed.

The following is a discussion of the database fields used and assumptions made during data extraction:

FIELDS

WELL NUMBER/WELL LOCATION

When the well number or well location was larger than the Minnesota Pollution Control Agency (MPCA) defined field width (6 characters), abbreviations were entered on the database. Sample blanks and samples with unspecified locations were assigned alphanumeric codes by the CEAT. These assigned codes were also entered in this field. A list of all well numbers entered in the database and corresponding well locations identified in the data is shown on Table 1. A separate list of well numbers assigned to sample blanks and unspecified sample locations appears in Table 2. The CEAT did not attempt to correlate all the well locations found in the data with the USGS defined well locations provided by G. Lowry (MPCA).

DATE

The date entered in the database was the date the sample was collected. If the collection date was not provided to the CEAT, the laboratory analysis date or report date was entered in that order. If the month and year were given, but no day was specified, an "01" was entered for the day. If only the year was given, "01" was entered for both the day and the month. If no day, month, or year was specified, all zeros were entered.

Some Minnesota Department of Health (MDH) data with five digit lab sample numbers beginning with 5 5 _ _ _ were without dates. Some of

NON-RESPONSIVE

DATE (CONTINUED)

the data was correlated with the "CH2M Hill Attachment D-4 Chronological Summary of Water Quality Analyses" where the date was given, and this date was entered on the database. For the remaining data having similar lab numbers but not found on the CH2M Hill Summary, it was assumed that the samples were collected in the same year. The date entered for these samples was 01-01-79.

LAB SAMPLE NUMBER

The laboratory sample number as specified in the original data was entered in this field. If the laboratory sample number was not specified, an "UNK" followed by a number was assigned by the CEAT. A list of the "UNK" sample numbers used appears on Table 3.

The width of the laboratory sample number field was increased from 6 characters to 10 characters as per a phone conversation with M. Simonett on October 10, 1984.

For samples given the same laboratory number, and analyzed for organics and inorganics parameters, an O or an I was added to the respective sample numbers. In those instances where the same sample information was extracted twice (i.e., duplicate information was extracted and entered) we assigned an X or a Y to the duplicate lab sample numbers.

LABORATORY

Each laboratory performing sample analysis was given a number code by the CEAT. Each laboratory and the corresponding number code used is listed in Table 4.

PARAMETER

In October 1984, Mark Simonett (MPCA) consolidated some of the inorganic/general parameters at the CEAT's request. As the data extraction process continued, the CEAT found it necessary to add several new parameters to the list. In addition, the Magnesium data was divided into two categories and the Solids data into three categories. The reporting format used for Magnesium and Solids data is as follows:

Mg as $CaCO_3$	
Magnesium as $CaCO_3$	
Magnesium, Diss as $CaCO_3$	all as Magnesium as $CaCO_3$
Magnesium	as Magnesium

PARAMETER (CONTINUED)

Total Filterable Solids Total Suspended Solids	both as Total Suspended Solids
Total Dis Solids Total Non-filterable Residue	both as Total Dissolved Solids
Solids Total Solids	both as Total Solids

All the organic and inorganic/general parameters including the consolidated inorganic parameters, and their corresponding parameter numbers are listed in Table 5.

CONCENTRATION

Parameter concentrations were entered in parts per trillion (ppt). If a concentration was reported as a range, the highest number was entered with a "1" in the data qualifier field and a comment in the the remarks file. Concentrations found that were greater than the field width were entered as presented in the data and are listed in Table 6 as a cross-check to the data tape. The parameters listed in Table 7 could not be converted to ppt and were entered as found in the data.

DETECTION TYPE

The following codes were entered in the detection type field:

NA	Parameter not analyzed or not determined.
_ <	Parameter not detected, the detection limit was entered in the concentration field (_ denotes a blank space).
P <	Parameter was present, but found at a level that is below the detection limit. The detection limit was entered in the concentration field.
_ _	Parameter quantified, quantity reported was entered.
CO	Parameter co-elutes with one or more other parameter.
TR	Trace, parameter was present in trace quantities.
_ >	The actual concentration was greater than the concentration reported.
SA	Indicates instrument saturation.

DETECTION LIMIT

When a parameter was reported with a concentration and with the detection limit for this parameter, the detection limit was entered in this field.

When a detection limit was reported as a range, the highest number was entered as the detection limit. A "1" was entered in the data qualifier field and a comment was entered in the remarks file. When a detection limit was reported for a parameter, but no concentration was reported, the detection limit was entered in the concentration field.

DATA QUALIFIER

A "1" entered in the data qualifier field indicates that additional information about the flagged parameter was entered in the remarks file. If information pertains to the entire sample a remark was entered, however, a "1" was not entered for any of the parameters. Consequently, it is possible for the remarks file to contain information about the sample when a "1" did not appear in the data qualifier field.

METHOD

This is a three-character code assigned by the CEAT and used to describe the method of analysis for a parameter. The analytical method codes used are listed in Table 8.

REMARKS

The remarks file was used when footnotes or comments regarding the sample were present in the data. When there was not enough room in the remarks file to report all footnotes found in the data, "See Original Data Sheet" was entered. The phrase "Original Data Sheet" could refer to an individual data sheet, analytical summary, cover letter, or an entire report. A list of of common abbreviations used in the remarks file is included in Table 9.

ASSUMPTIONS

TENTATIVELY IDENTIFIED COMPOUNDS

Tentatively Identified Compounds (TICs) were flagged with a "1" in the data qualifier field when only a few of the parameters for a sample were TICs. If all parameters were TICs, a "1" was not listed in any of the data qualifier fields. Instead, a general statement was made in the remarks file regarding the TICs.

SPIKED SAMPLES

The percent recoveries for spiked samples were sometimes found in the analytical data. "Spike Recovery Information In Original Data" was entered in the remarks file when this occurred. If the remarks file was full, the comment "See Original Data" was added. Therefore, the presence of spike recovery information was not always specifically noted in the database.

CAPSULE LABORATORY

Spike recovery information was reported for the following samples from Capsule Laboratory. However, the analytical data for the unspiked samples were not found in the Capsule report. The spike recovery information was not entered in the database since there was no sample information to correlate with the recoveries. The spike recovery data, well locations, and Capsule Laboratory numbers are:

	Well 12 Capsule # 14353.04	Well 6 Capsule # 14453.07	Well 4 Capsule # 14453.09
D_{12} Chrysene	34	79	47
D_8 Naphthalene	0.6	1.5	0.4
D_{10} Phenanthrene	79	72	68
D_{10} Pyrene	40	44	35
Spike Level	Medium	Low	High

WATER ASHING

When the sample analysis "water ashing" was listed with no analytical results and with the footnote "sample composited radiation or ashed-metal", the sample was not entered in the database.

MINNESOTA DEPARTMENT OF HEALTH DATA

When Minnesota Department of Health (MDH) data reported Polynuclear Aromatic Hydrocarbons (PAHs) and did not report the method of analysis, the CEAT assumed that the method was HPLC.

MIDWEST RESEARCH INSTITUTE

Three assumptions apply to the analytical data from the Midwest Research Institute (MRI) October 7, 1981, Final Report. The assumptions are as follows:

a. GC/MS ANALYSIS (MRI TABLE 2, PART 1)

   The estimated detection limits found in MRI Table 9 were entered in the concentration field and a "<" was placed in the detection type field for each parameter where a concentration value was not given for a sample. If a concentration value was reported for a parameter, the estimated detection limit found in the MRI Table 9 was entered in the detection limit field.

b. H.P.L.C. ANALYSIS (MRI TABLE 5)

   Estimated detection limits for 16 polycyclic aromatic hydrocarbon compounds are listed in MRI Table 10. Detection limits for the first six compounds appeared to be the results of UV detection while the remaining ten detection limits appeared to be the result of fluorescence detection.

   MRI Table 5 lists the analytical results for the 16 compounds in selected water samples. The letter "U" by the parameter value indicated which results were from UV detection. Compounds for which estimated fluorescence detection limits were given were sometimes reported using UV detection (for which no detection limits were provided in the report) and vice versa. No detection limits were entered in the database for these special cases.

   The other results were treated similarly to the GC/MS data (a). Blank spaces were assumed to be undetected values and, therefore, less than the estimated detection limits listed in MRI Table 10.

b. H.P.L.C. ANALYSIS (MRI TABLE 5) (CONTINUED)

Analytical results were not reported as less than the detection limit for Sample 810511D, because interferences obscurred the entire chromatogram as reported in the data. Brief notes were placed in the remarks field for Samples 810518 and 810519 referencing interfering peaks. However, interference problems with the anthracene, fluoranthene, and pyrene parameters for all samples were not specifically addressed in the remarks or given special treatment during extraction.

c. VOA METHOD BY GC/MS AND PURGEABLE AROMATIC COMPOUNDS BY GC/MS (MRI TABLES 6 AND 7)

GC/MS estimated detection limits reported in MRI Table 9 were not considered during the extraction of this data because there were no direct references to the detection limits in the text of the report.

When the concentration values on the MRI Table 7 specified "See Table 6"; the identified compound was not extracted.

ERT PRELIMINARY REPORT

ERT's preliminary analytical report of October 10, 1982 included a summary table. This information was not in a format that could be readily entered in the database. The summary information from the ERT preliminary report is listed on Table 9.

CH2M HILL SUMMARY AND "CHRONOLOGICAL RECORD OF WELL WATER ANALYSES" DATA

A copy of the "CH2M Hill Attachment D-4 Chronological Summary of Water Quality Analyses" was provided to the CEAT by the MPCA. All data summarized on this appendix was compared to the extraction data to assure that the data set was complete. Any samples found on the summary which were not found in the original data were extracted directly from the CH2M Hill summary into the database. The data entered by the CEAT included the following kinds of information:

a. parameter concentrations;
b. parameters which were not detected that were entered as ND;
c. parameters having a peak found below the detection limit that were entered as P <;
d. parameters which were listed on a data sheet for a sample as a blank space with no analytical information that were reported as NA.

CH2M HILL SUMMARY AND "CHRONOLOGICAL RECORD OF WELL WATER ANALYSES" DATA (CONTINUED)

Two exceptions to this procedure should be noted. The first was the "CH2M Hill Attachment D4 Chronological Summary of Water Quality Analyses". Each page contains the footnote "Data summaries for all data prior to 1/15/82 prepared by EPA. All compounds found at less than detection limit have been deleted". It is not possible to determine if blank spaces represent parameters which were not analyzed, or parameters which were below the detection limit. For this reason only the concentrations were entered on the database, and no comment pertaining to this fact was entered in the remarks file. The second exception occurred with 17 tabulation sheets titled "Chronological Record of Well Water Analyses". A statement at the top of each of the pages also noted "Data summaries for all data prior to 1/15/82 prepared by EPA. All compounds found at less than detection limit have been deleted". Again, it was not possible to determine if blank spaces represent parameters which were not analyzed, or parameters which were below the detection limit. Therefore, only the concentrations were entered.

The CH2M Hill summary occasionally contained illegible concentration units due to copy quality. The CEAT assumed that all units were reported in ng/l.

In addition to analytical results, the "Chronological Record of Well Water Analyses" also contained totals for carcinogenic and "other" polynuclear aromatic hydrocarbons (PAHs) listed on these tabulation sheets. This information was not in a form that could be readily entered in the database. These totals are listed on Table 10.

PHENOL RESULTS

When phenol results were reported with organic analytical results they were entered in the database as:

Match #	Reported in database as
227	phenol
621	phenols
622	phenolics

When phenol results were reported with the inorganic analytical data they were entered in the database as:

PHENOL RESULTS (CONTINUED)

Match #	Reported in database
447	phenol
448	phenol, MBTH: phenol, (MBTH Method)
449	phenolics; phenols; total phenol; phenolic compounds as phenol

GENERAL COMMENTS

Illegible data was not entered in the database. A comment was entered in the remarks file stating that part of the information for the sample was illegible.

When data was found that could not be correlated with a well location or a laboratory it was not included in the database.

As per a phone conversation with G. Lowry (MPCA) on October 8, 1984, no soil sample information was extracted and entered on the database. As per a phone conversation with G. Lowry (MPCA) on December 10, 1984, one sludge sample found in the MRI data was extracted and entered on the database.

BB/lkl

Attachments

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